IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of :

Yoshiro SHIOKAWA :

Serial No. NEW : **Attn: Application Branch**

Filed April 3, 2001 : **Attorney Docket No. 2001-0394A**

Q-POLE TYPE MASS SPECTROMETER

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents,
Washington, DC 20231

Sir:

Prior to examination of the above-referenced U.S. patent application please amend the application as follows:

IN THE CLAIMS

Please amend the claims as follows:

6. (Amended) The Q-pole type mass spectrometer according to claim 2, characterized in that upon control on the motion of ion to be measured in the axial direction within the Q-pole region, Coulomb force is employed, the sad Coulomb force is generated by electric field formed by four Q-poles composing the Q-pole type mass spectrometer, so constructed that four Q-poles have an equal DC potentials except DC voltage: U at the same position in the axial direction of each Q-pole of four Q-poles, while the each Q-pole of four Q-poles has different DC potentials depending on their positions in the axial direction.

8. (Amended) The Q-pole type mass spectrometer according to claim 2, characterized in that control on the motion of ion to be measured in the axial direction within the

Q-pole region uses a reaction force generated by a collision between the ion to be measured and the atmospheric gas.

10. (Amended) The Q-pole type mass spectrometer according to claim 2, characterized in that control on the motion of ion to be measured in the axial direction within the Q-pole region is carried out by setting the length of the Q-pole, kind and pressure of the atmospheric gas, potential of the ion source and potential on the axis of the Q-pole so that the ion to be measured is capable of passing the Q-pole region without receiving any additional force int he axial direction.

11. (Amended) The Q-pole type mass spectrometer according to claim 2, characterized in that control on the motion of ion to be measured in the axial direction within the Q-pole region is carried out using Coulomb force generated by space charge formed by the ion to be measured within the Q-pole region.

13. (Amended) The Q-pole type mass spectrometer according to claim 2, characterized in that control on the motion of ion to be measured in the axial direction within the Q-pole region is carried out using Lorentz force generated by high-frequency magnetic field synchronous with quadrupole high-frequency electric field applied in the diameter direction.

14. (Amended) The Q-pole type mass spectrometer according to claim 2, characterized in that control on the motion of ion to be measured in the axial direction within the Q-pole region is carried out using electromagnetic induction force generated by a magnetic field changing in its intensity with time passage, applied in the diameter direction.

REMARKS

The present Preliminary Amendment is submitted to delete the multiple dependency of the claims, thereby placing such claims in condition for examination and reducing the required PTO filing fee.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current Amendment. The attached page is captioned "**Version With Markings to Show Changes Made**".

Respectfully submitted,

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6. (Amended) The Q-pole type mass spectrometer according to [any one of claims 2 to 5] claim 2, characterized in that upon control on the motion of ion to be measured in the axial direction within the Q-pole region, Coulomb force is employed, the sad Coulomb force is generated by electric field formed by four Q-poles composing the Q-pole type mass spectrometer, so constructed that four Q-poles have an equal DC potentials except DC voltage: U at the same position in the axial direction of each Q-pole of four Q-poles, while the each Q-pole of four Q-poles has different DC potentials depending on their positions in the axial direction.

8. (Amended) The Q-pole type mass spectrometer according to [any one of claims 2 to 5] claim 2, characterized in that control on the motion of ion to be measured in the axial direction within the Q-pole region uses a reaction force generated by a collision between the ion to be measured and the atmospheric gas.

10. (Amended) The Q-pole type mass spectrometer according to [any one of claims 2 to 5] claim 2, characterized in that control on the motion of ion to be measured in the axial direction within the Q-pole region is carried out by setting the length of the Q-pole, kind and pressure of the atmospheric gas, potential of the ion source and potential on the axis of the Q-pole so that the ion to be measured is capable of passing the Q-pole region without receiving any additional force int he axial direction.

11. (Amended) The Q-pole type mass spectrometer according to [any one of claims 2 to 5] claim 2, characterized in that control on the motion of ion to be measured in the axial direction within the Q-pole region is carried out using Coulomb force generated by space charge formed by the ion to be measured within the Q-pole region.

13. (Amended) The Q-pole type mass spectrometer according to [any one of claims 2 to 5] claim 2, characterized in that control on the motion of ion to be measured in the axial direction within the Q-pole region is carried out using Lorentz force generated by high-frequency magnetic field synchronous with quadrupole high-frequency electric field applied in the diameter direction.

14. (Amended) The Q-pole type mass spectrometer according to [any one of claims 2 to 5] claim 2, characterized in that control on the motion of ion to be measured in the axial direction within the Q-pole region is carried out using electromagnetic induction force generated by a magnetic field changing in its intensity with time passage, applied in the diameter direction.